

2003

Charting the Bird Populations of Mammoth Cave National Park

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**Charting the Bird Populations of Mammoth Cave National
Park**

A Thesis for the University Honors Program

Kristen Jones

Fall 2003

Approved by

Wayne M. Mask
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DM

Abstract

This thesis documented the bird species at Mammoth Cave National Park in south-central Kentucky. Bird species populations were documented as increasing, decreasing, or extirpated, meaning they were no longer seen in the Mammoth Cave National Park area. We found that the majority of the populations had remained unchanged due to strict management policies adhered to by Mammoth Cave National Park.

Acknowledgements

Thanks to the faculty of Western Kentucky University who contributed in some way, large or small, to this thesis. Also, special thanks to Mr. Wayne Mason, my advisor.

To Thomas for all the support and patience he has shown me through this entire process. You have taught me that patience is definitely a virtue.

Lastly, I dedicate this thesis in its entirety to Cricket. Birds all across Kentucky were given a second chance at life when you became an indoor cat. Cheers, and enjoy Heaven.

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Introduction

From the mountainous regions in the east to the lowlands along the Mississippi River in the west, Kentucky is home to a surprising diversity of wildlife, including birds. Monroe (1994) recognized 331 species of birds that have been documented as living in the state, with an additional 14 species listed as probable due to suspect or inadequate records of documentation.

Unfortunately, researchers have recognized serious declines in the populations of some species, particularly native grassland species and those that migrate to the neotropics (Bollinger, 1994; Herkert, 1994; Robbins, C.S., Fitzpatrick, J.W., & Hamel, P.B. 1989). Mammoth Cave National Park, in south-central Kentucky, offers a unique opportunity for one to study population stability in these species, as the habitats within the park have been relatively undisturbed since the park's inception in 1941 (Bidwell, 1952). Furthermore, the National Park Service has expressed an interest in documenting 90% of the vertebrates, including birds, that utilize National Park lands by funding the Vertebrate Surveys of Parks Initiative (National Park Service Document CESU w/UT-H5000 99 A007). Although Mammoth Cave National Park's avifauna has been studied before (Wilson, 1946; 1961; 1968), little has been done over the past thirty years to update possible changes in species composition and status of the birds utilizing the habitats of Mammoth Cave National Park.

The purpose of this project is to document the occurrence of those species of birds that overwinter and breed within the boundaries of Mammoth Cave National Park, and to identify those species that have exhibited declines or increases in numbers over the past thirty years.

Study Area

Mammoth Cave National Park (hereafter, MCNP or “the Park”) is located in south-central Kentucky (Figure 1). At the present time, its boundaries extend across the counties of Edmonson, Hart, and Barren, encompassing approximately 52, 830 acres (Uhler 1a, 1998). The Park is best known for its extensive subterranean network of caves, tunnels, and passageways with approximately 350 miles officially mapped and an estimated additional 600 miles of undiscovered passageways (Uhler 1b, 1998). Nearly two million tourists visit the cave annually to experience its underground wonders, but few take advantage of the 70 miles of above-ground hiking trails that meander through the mostly forested valleys, ridge tops, and bottomlands.

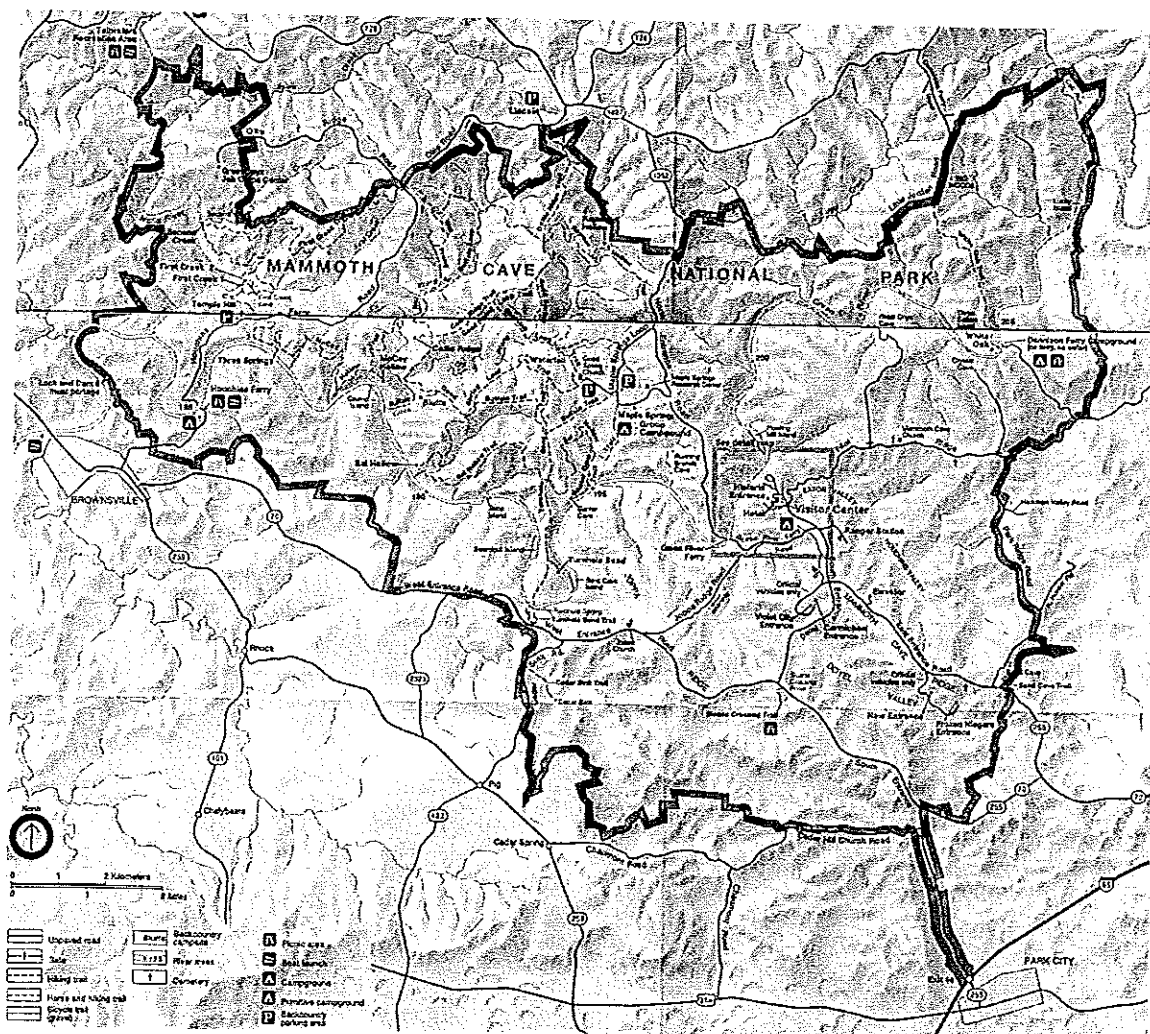
Ecologically, MCNP rests on a plateau approximately 500 feet above sea level (Barbour, et al, 1973). Two river drainages are associated with the Park: the Green River runs east to west [from Hart County to Edmonson County] through the approximate middle of the Park, dividing it into northern and southern portions, while the Nolin River enters the Park at its northwestern corner, running south to its entry into the Green River near Houchin’s Ferry. Wilson (1968) recognized 5 distinct ecological zones with which are associated particular assemblages of bird species:

- A. The three *ridges* south of the river with productive soil. In the past, they were farmed extensively, and most of the trees were removed.

- B. The *cliffs* at the edges of these ridges, where the sandstone and limestone have broken away, leaving some very rough terrain that was unsuited for farming. These have remained as forested land.
- C. The *ridges* and *hills* north of Green River were covered by good soil which eroded easily when farmed.
- D. The *sinkholes* and *valleys*, chiefly in the southern half of the park, are dry most of the time due to underground drainage.
- E. The narrow, fertile *river bottoms*.

Although MCNP was authorized by Congress in 1926, the land had to be gradually acquired from private landowners over the next several years before the park was formally established in 1941 (Bidwell, 1952). Much of this private land was logged and cultivated farmland; thus, the habitat in the early years of the park's history was a mosaic of abandoned farmland and forested valleys and ravines. After its formal designation as a National Park, the "hands off" land-use practices of the National Park Service has allowed the acreage to succeed undisturbed for over sixty years into a large track of mature second-growth forest. The changes in the landscape have been mirrored by changes in the avifauna that regularly use the park (Wilson, 1961).

Figure 1



Materials and Methods

Data for the winter portion of this project were obtained from several sources. Seventeen field trips were conducted to various locations within MCNP beginning in November 2002 and concluding in March 2003. Attempts were made to visit each habitat type within the park at least twice during the study period. Field trips varied in duration from 1.5 to 8 hours. During each trip, all species observed and/ or heard on MCNP property were noted and their numbers recorded.

Field-trip data were compared to mid-winter bird count data from 1970-2002 to note possible trends or changes in bird populations over the past 30 years. These were then compared with observations from Wilson (1968) to provide a comprehensive view of changes in the wintering populations of birds in the park.

Since fieldwork for this project was conducted during the winter season, no field trips related to breeding bird occurrences could be conducted. However, a portion of Mammoth Cave National Park is included as part of a Breeding Bird Survey route that has been conducted in this area since 1966.

The Breeding Bird Survey is a roadside survey established by the Nongame Division of the United States Fish and Wildlife Service and coordinated by the United States Geological Survey and Canadian Wildlife Service (Pardieck, et al, 2001). The Breeding Bird Survey protocol consists of a 24.5 mile roadside route divided into fifty

stops that run roughly north to south along U.S. roadways. The survey must be conducted during the five-week period extending from the last week of May to the last week of June. Participants begin one-half hour before sunrise, then stop every .5 miles along the route for three-minute durations, during which time they record all birds seen and/ or heard during the stop. The surveys are intended to run at about the same date every year with each stop occurring in the same place each year. It is hoped that over many years, trends in bird populations may be noted as they occur. Breeding Bird Survey Route number 39-028 [“Demunbrum’s”] begins just north of MCNP but enters MCNP territory at Houchins Ferry Road (Figure 1). The route proceeds through the Park for eleven stops before exiting on the southern edge of MCNP after crossing the Green River near Brownsville, Kentucky. The route then continues to border the park boundary for an additional eight stops. Data from these nineteen stops were used to note population changes of breeding birds within Mammoth Cave National Park. Both sets of data were then used to compile separate lists of the winter and breeding birds that may be found within the confines of Mammoth Cave National Park:

Permanent residents are defined as those bird species that may be found, in suitable habitat, throughout the year within the Park boundaries.

Breeding birds are defined as those bird species that may be found, in suitable habitat, breeding in the area during the summer months (late May through August). Some of these species will migrate out of the area during the fall, returning to the breeding grounds the following spring.

Winter birds are defined as those bird species that may be found, in suitable habitat, during the winter months of the year (December through March). Many will migrate out of the area during the spring to breed elsewhere during the summer months, eventually returning to the area the next autumn.

Transients are defined as those bird species that merely migrate through the Park en route between their normal breeding/wintering grounds.

For each list, an attempt was made to denote the relative abundance of each species. The descriptions are meant to indicate the *likelihood* of encountering the species in suitable habitats. The following terms are used to describe a species' relative abundance:

Abundant: The species is present in large numbers in suitable habitats.

Common: The species is very likely to be encountered in suitable habitats, but is not as numerous as an abundant species.

Uncommon: The species occurs regularly in suitable habitats, but is infrequently encountered.

Rare: The species is present in very small numbers in suitable habitats, and is scarcely encountered.

Erratic: The species' occurrence in the area is unpredictable, being common - even abundant – at one time, and absent at others.

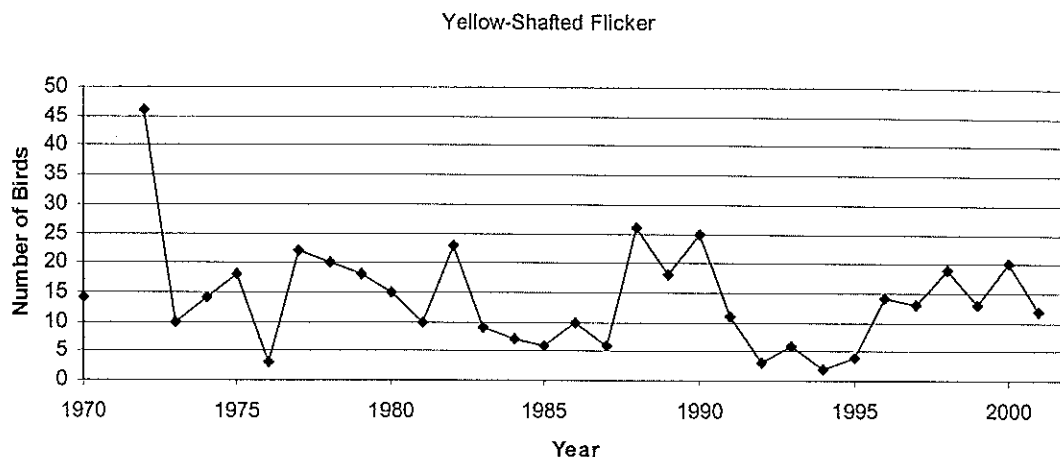
Results and Discussion

Winter Bird Species:

Since 1970, a total of 85 species, representing 13 orders and 37 families, have been recorded at Mammoth Cave National Park during the winter season (List 1). Of these, 50 species are permanent residents, and thus, may be encountered at any time of the year in suitable habitats. The remaining 35 species are considered winter residents, being observed only during the winter season. In Wilson's 1968 summary, he recognized 42 permanent residents and 27 winter species. Wilson (1968) indicated that a "good day's list" for a single party during the winter would be between 35-40 species. Winter counts taken during November 2002 and March 2003 yielded an average of 45 species per count, which compares well with Wilson's results.

The populations of most winter species, though displaying fluctuations from year to year, have remained relatively stable. Typical of this trend are the numbers of woodpeckers recorded during mid-winter bird counts since 1970. The Yellow-shafted Flicker mirrors this trend (Figure 2).

Figure 2



Other species, however, have shown significant declines since 1970. In particular, 4 winter species, which were formally rather common within MCNP territory, are no longer observed and, thus, are regarded as extirpated from the Park. These species are

Northern Harrier (*Circus cyaneus*)

Northern Bobwhite (*Colinus virginianus*)

Bewick's Wren (*Thryomanes bewickii*)

Loggerhead Shrike (*Lanius ludovicianus*)

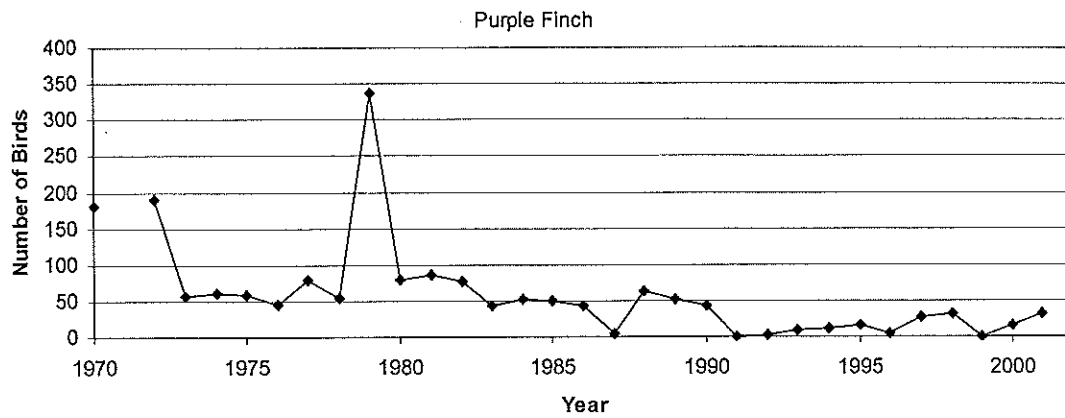
Their absence from the Park is probably related National Park Service Practices in which acquired lands are managed to succeed naturally with little interference by man. As a result, the farm and brush lands preferred by these species (which were present in the

early years of the Park's establishment) have gradually succeeded to the heavily forested landscape that is prevalent today (Peterjohn, et.al., 1999). Evidence to support this is seen in the results of mid-winter bird counts taken in areas near Mammoth Cave National Park, where these species may still be encountered.

Of particular interest is the significant drop in the population of Purple Finches. Wilson (1968) stated that this species was a "common winter resident" and was "more numerous in the Park than in other regions of the state during mid-winter bird counts." Figure 3, however, clearly displays a significant decrease in the number of Purple Finches wintering at Mammoth Cave National Park.

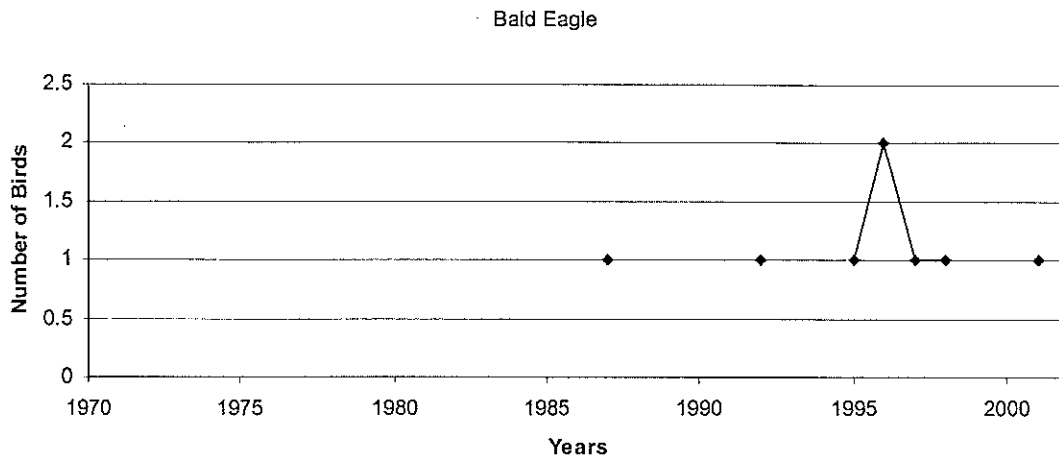
This decline has been noted elsewhere in the Eastern United States (Pardieck and Sauer, 2000). Authorities are unsure of the reasons behind it, but some researches have implicated the concurrent increase in the House Finch Populations as a possible factor (Morton and Greenberg, 1989). Although House Finch numbers have increased dramatically in Kentucky since 1985, they prefer more suburban, park-like areas, and are rarely encountered in heavily forested regions of MCNP (Wayne M. Mason, personal communication).

Figure 3



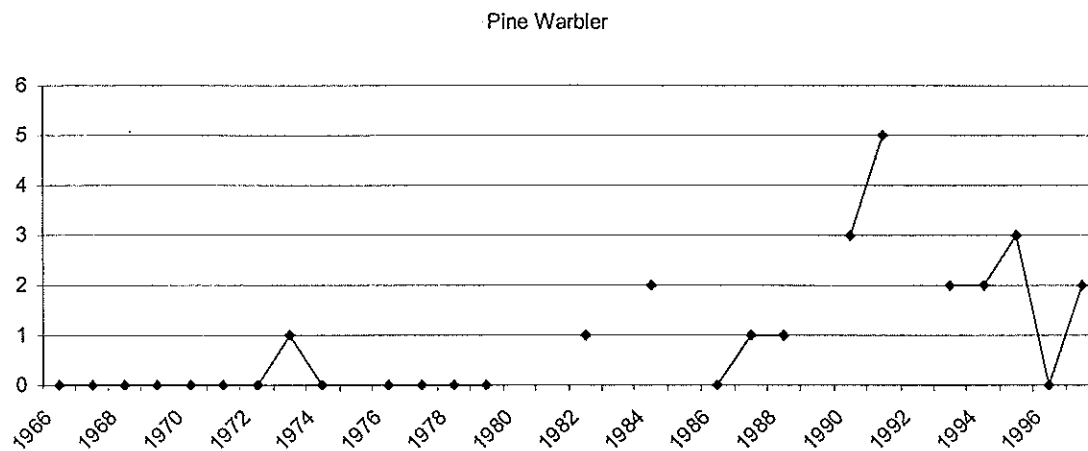
Other species have exhibited increased numbers over the last 30 years. One of these is the Bald Eagle, a species that has shown dramatic increases nationwide as a result of conservation efforts to restore its population. Although the species had been occasionally reported from MCNP during the 1950s and 1960s (Wilson, 1961), it has become a regular winter resident at the Park since 1993 (Figure 4). Though never present in large numbers (the most observed during any one field trip was 3), its occurrence is so regular over the last few years that the species is now expected each winter in the vicinity of First Creek Lake and Houchins Ferry.

Figure 4



The Pine Warbler is another species that has shown increased occurrences in the Park (Figure 5). This species is one of the few of the family Parulidae which will occasionally overwinter during mild winters in North America (Dunn and Garrett, 1997). It has rather strict habitat requirements, preferring tracts of older, mature pines in dry upland habitats. Pine plantings at MCNP have matured sufficiently enough over the last 50 years to provide suitable habitat for this species, as evidenced by the increased frequency with which it has been recorded over the last few winters.

Figure 5



List 1 reflects the species of birds that have wintered at MCNP since 1970. Also included in this list are those species considered to be permanent residents. The arrangement of species, common names, and scientific names follow the most recent update to the American Ornithologists' Union Checklist of North American Birds (1998; 2000).

List 1. Mid-winter Birds Recorded at Mammoth Cave National Park

ORDER PODICIPEDIFORMES

Family Podicipedidae

Pied-Billed Grebe (*Podilymbus podiceps*)-rare winter resident; seen most often at the Sloan's Crossing/ Beaver Pond or along the rivers.

ORDER CICONIIFORMES

Family Ardeidae

Great Blue Heron (*Ardea herodias*)-rare permanent resident; observed primarily along the banks of the Green and Nolin Rivers; occasionally observed at the Sloans's Crossing/Beaver Pond.

ORDER ANSERIFORMES

Family Anatidae

Canada Goose (*Branta canadensis*)-A common permanent resident in the farmlands adjacent to MCNP; an uncommon sight in flights over the park.

Mallard (*Anas platyrhynchos*)-A fairly common winter resident, seen most frequently at First Creek Lake or along the Green River at Turnhole Bend and Cave Island.

Gadwall (*Anas strepera*)-A very rare transient/winter resident. Most often associated with Mallard and Black Ducks, it has only recently been found within the park.

American Black Duck (*Anas rubripes*)-A rare to uncommon winter resident, most often observed in the company of Mallards.

Wood Duck (*Aix sponsa*)-A common permanent resident, seen most frequently at Sloan's Crossing/Beaver Pond, First Creek Lake, and along the Green River near Houchins and the Mammoth Cave ferries.

Greater Scaup (*Aythya marila*)-Very rare transient/winter resident, recorded only once (1986) since 1970.

ORDER FALCONIFORMES

Family:Accipitridae

Sharp-Shinned Hawk (*Accipiter striatus*)-Rare to uncommon winter resident (possibly permanent resident), but seen with increasing frequency over the last ten years.

Cooper's Hawk (*Accipiter cooperii*)-Uncommon permanent resident.

Red-Shouldered Hawk (*Buteo lineatus*)-An uncommon permanent resident, observed most frequently at river bottoms.

Red-tailed Hawk (*Buteo jamaicensis*)-Common permanent resident. The most common hawk likely to be seen soaring over Mammoth Cave National Park.

Rough-Legged Hawk (*Buteo lagopus*)-A very rare winter resident. Formerly more common along the weedy fields near transmission-line corridors and woodland clearings, this species has moved to more open habitats in the surrounding farmland adjacent to the park.

Bald Eagle (*Haliaeetus leucocephalus*)-A rare, but regular winter resident. Since 1987, as many as three Bald Eagles have wintered in the park. They are very local in their occurrence, seen almost exclusively in the First Creek Lake/Houchins Ferry area.

Northern Harrier (*Circus cyaneus*)-Formally a very rare winter resident, this species is now believed to be extirpated from the park. It is occasionally seen in open, grassy areas outside the park, but it has been observed within the park only once since 1970 (1982).

Family Falconidae

American Kestrel (*Falco sparverius*)-Very rare permanent resident. Formally more common, but has largely relocated to suitable habitats outside the park boundaries. May still be seen in the vicinity of the Visitors' Center and the Job Corps Center.

ORDER CICONIIFORMES - why not move to other group within Accipitriformes?

Family Cathartidae

Turkey Vulture (*Cathartes aura*)-Common permanent resident. More common during the spring and summer than in winter.

Black Vulture (*Coragyps atratus*)-Uncommon permanent resident, but becoming increasingly more common. Forms large roosts with Turkey Vultures just outside park boundaries.

ORDER GALLIFORMES

Family Odontophoridae

Northern Bobwhite (*Colinus virginianus*)-Formally a rare to fairly common permanent resident, this species has essentially been extirpated from Mammoth Cave National Park. It is still fairly common in the farmland adjacent to the park.

Family Phasianidae

Wild Turkey (*Meleagris gallopavo*)-A common permanent resident. Introduction of this species into the park during the 1960s and early 1970s has been very successful and now this bird may be seen just about any location within the park.

ORDER GRUIFORMES

Family Gruidae

Sandhill Crane (*Grus canadensis*)-An uncommon transient observed in flights over the parks, but not recorded on the ground. Its occurrence over the park is erratic and unpredictable, but most likely to be seen or heard from mid-December to late March.

Late winter 2003 (February – March) witnessed several large flights of Cranes over the park.

Family Rallidae

American Coot (*Fulica americana*)-A very rare winter resident, all records consist of single birds observed on the Green River near Houchins Ferry.

ORDER CHARADRIIFORMES

Family Charadriidae

Killdeer (*Charadrius vociferus*)-A very rare permanent resident, most often heard flying over Mammoth Cave National Park; rarely observed on the ground. Seen most often at the Job Corps Center athletic fields.

American Woodcock (*Scolopax minor*)-An uncommon summer resident that may occasionally remain through early winter until harsh weather settles in. This species has been recorded only once during the mid-winter bird count of 1974.

Wilson's Snipe (*Gallinago gallinago*)-A very rare transient that may occasionally remain through early winter. Like the American Woodcock, it too has been recorded only once since 1970 (1996).

ORDER COLUMBIFORMES

Family Columbidae

Rock Pigeon (*Columba livia*)-The familiar “pigeon” is an abundant, permanent resident in areas outside the park, but is very rare within the park boundaries. All records consist of small flocks flying over the park.

Mourning Dove (*Zenaida macroura*)-A fairly common permanent resident, more common in the surrounding farmland outside the park.

ORDER STRIGIFORMES

Family Strigidae

Eastern Screech Owl (*Otus asio*)-An uncommon permanent resident. Heard most often near the park boundaries especially along Ugly Creek Road.

Great Horned Owl (*Bubo virginianus*)-A common permanent resident and apparently increasing in number. Most often encountered along the drier ridge tops.

Barred Owl (*Strix varia*)-A common permanent resident of bottomlands and valleys. This is the most common owl in Mammoth Cave National Park and is occasionally observed roosting in trees along road sides and trails.

ORDER CORACIIFORMES

Family Alcedinidae

Belted Kingfisher (*Ceryle alcyon*)-An uncommon permanent resident, ^{most records are from} ~~seen most often at~~ First Creek Lake, Sloan's Crossing Pond or along the Green and Nolin Rivers.)

ORDER PICIFORMES

Family Picidae

Yellow-Shafted Flicker (*Colaptes auratus*)-A common permanent resident.

Pileated Woodpecker (*Dryocopus pileatus*)-A common permanent resident, most frequently observed in the older stands of deciduous forest in the park.

Red-Bellied Woodpecker (*Melanerpes carolinus*)-A common permanent resident, this is probably the most common woodpecker in the park.

Red-Headed Woodpecker (*Melanerpes erythrocephalus*)-A rare to uncommon permanent resident. Its numbers have declined in recent years but it may still be observed in the Maple Springs and Residential Areas.

Yellow-Bellied Sapsucker (*Sphyrapicus varius*)-An uncommon to common winter resident.

Hairy Woodpecker (*Picoides villosus*)-A common permanent resident, most often observed in the winter.

Downy Woodpecker (*Picoides pubescens*)-A common permanent resident rivaling the Red-bellied Woodpecker in abundance. It is likely to be encountered anywhere within the park.

ORDER PASSERIFORMES

Family Tyrannidae

Eastern Phoebe (*Sayornis phoebe*)-An uncommon permanent resident, seen less frequently during mild winters. The species exhibits strong site fidelity during the winter seasons, usually in the same area each winter. ?

Family:Corvidae

Blue Jay (*Cyanocitta cristata*)-A common permanent resident in all areas of the park, especially along the drier oak hickory ridge tops.

Common Crow (*Corvus brachyrhynchos*)-A common permanent resident, at times even abundant, during the winter. Roosts in large flocks just outside the park boundaries during winter. The roosts disperse as small flocks that feed within the park during the day.

Family Paridae

Carolina Chickadee (*Poecil carolinensis*)-A common permanent resident in all seasons within the park.

Tufted Titmouse (*Baeulophus bicolor*)-A common permanent resident in all seasons within the park, usually traveling in mixed flocks with Carolina Chickadees during the winter.

Family:Sittidae

White-Breasted Nuthatch (*Sitta carolinensis*)-An uncommon to common permanent resident, usually more visible in winter than at any other time of the year. Also associated with Carolina Chickadees and Tufted Titmice during the winter.

Red-Breasted Nuthatch (*Sitta canadensis*)-An erratic winter resident, rare to absent during some winters, abundant during others. Recorded with more regularity over the last twenty years as the pine stands in the park have matured.

Family Certhiidae

Brown Creeper (*Certhia familiaris*)-An uncommon winter resident, observed most frequently along the bottomland forests of the Green and Nolin rivers.

Family:Troglodytidae

Winter Wren (*Troglodytes troglodytes*)-A common winter resident but its secretive and quiet nature means it is often overlooked, found along riverbanks and ravines, foraging among exposed roots and leaf litter.

Bewick's Wren (*Thryomanes bewickii*)-Formerly a rare permanent resident, this species has most likely been extirpated from the park, as none have been recorded since the late 1960's.

Carolina Wren (*Thryothorus ludovicianus*)-A common permanent resident in all areas of the park, but severe winters can reduce their numbers appreciably.

Family Mimidae

Mockingbird (*Mimus polygottos*)-A rare to uncommon permanent resident, seen mainly in open areas and edge habitats along roadsides, camping areas, and transmission-line corridors.

Brown Thrasher (*Toxostoma rufum*)-An uncommon permanent resident, rare during winter months.

Family Turdidae

Robin (*Turdus migratorius*)-Common to abundant permanent resident, most common during the winter when large numbers flock together and forage among the leaf litter along the ravines and valleys.

also red
when cedars
bear fruit

Hermit Thrush (*Hylocichla guttata*)-Common winter resident, but secretive and easily overlooked. Found mainly in the deeper valleys and ravines.

Family Sylviidae

Eastern Bluebird (*Sialia sialis*)-An uncommon permanent resident.

Family Regulidae

Golden-Crowned Kinglet (*Regulus satrapa*)-Common winter resident, especially in the pine stands of MCNP.

Ruby-Crowned Kinglet (*Regulus calendula*)-Uncommon to rare winter resident.

Family Motacillidae

Water Pipit (*Anthus Spinoletta*)-A rare winter visitor, recorded once since 1970 (1991).

Family Bombycillidae

Cedar Waxwing (*Bonbycilla cedrorum*) -A common permanent resident, but nomadic and irregular in its occurrence during the winter.

Family Laniidae

Loggerhead Shrike (*Lanius ludovicianus*)-Formerly a rare permanent resident, this species is now believed extirpated from the park.

Family Sturnidae

Starling (*Sturnus vulgaris*)-An abundant permanent resident.

Family Parulidae

Yellow-rumped Warbler (*Dendroica coronata*)-A common to abundant winter resident. This is the only warbler species likely to be observed on a regular basis during the winter months. Its numbers fluctuate yearly, correlating closely with the abundance of Eastern Red Cedar (*Juniperus virginiana*) berries.

Pine Warbler (*Dendroica pinus*)-An uncommon permanent resident, but very rare during the winter months. Its occurrence has increased as pine stands in the park have matured.:

Family Emberizidae

House Sparrow (*Passer domesticus*)-A rare to uncommon permanent resident within the park; abundant in areas outside the park. Its occurrence inside the park is restricted to residential or commercial areas within the park boundaries.

Family Icteridae

Eastern Meadowlark (*Sturnella magna*)-This species was formerly a rare permanent resident within MCNP, but it has not been recorded within the park boundaries in the last thirty years.

Red-Winged Blackbird (*Agelaius phoeniceus*)-A common permanent resident in suitable habitats within the park; less common during winter. Usually observed in small flocks flying over the park during winter, but occasionally isolated birds may be seen at the Beaver Pond or First Creek Lake.

Rusty Blackbird (*Euphagus carolinus*)-A rare winter resident occasionally observed with Red-winged Blackbirds along the Green River or at First Creek Lake.

Common Grackle (*Quiscalus quiscula*)-A common permanent resident, though less common during the winter season. Often forms huge wintering roosts of thousands of birds just outside the park boundaries.

No Brewer's?

Brown-Headed Cowbird (*Molothrus ater*)-A common permanent resident, though less frequent in winter.

Family Cardinalidae

Cardinal (*Richmondia cardinalis*)-A common permanent resident throughout the park.

Family Fringillidae

Common Redpoll (*Carduelis flammea*)-Wilson (1969) listed this species as a very rare "winter visitor." It has not been recorded in MCNP since the 1960's.

Family Cardinalidae

Evening Grosbeak (*Coccothraustes vespertinus*)-An unpredictable winter resident that occasionally appears during the winter.

Family Fringillidae

Purple Finch (*Carpodacus purpureus*)-Formerly a common winter resident, this species has demonstrated a serious decline in numbers since the mid-1980's. It is now best regarded as a rare winter resident.

House Finch (*Carpodacus mexicanus*)-A rare permanent resident.

Pine Siskin (*Carduelis pinus*)-A rare, unpredictable, and erratic winter resident. When observed in MCNP, it is always associated with American Goldfinches in pine stands.

American Goldfinch (*Carduelis tristis*)-A common permanent resident.

Family Emberizidae

Rufous-Sided Towhee (*Pipilo erythrophthalmus*)-A common permanent resident.

Savannah Sparrow (*Passerculus sandwichensis*)-A rare winter resident, at the fields this species prefers have succeeded to woodlands.

Slate-Colored Junco (*Junco hyemalis*)-A common to abundant winter resident.

American Tree Sparrow (*Spizella arborea*)-A rare winter resident

Field Sparrow (*Spizella pusilla*)-A common permanent resident.

White-Crowned Sparrow (*Zonotrichia leucophrys*)-Formerly, a rare winter resident, but has not been recorded since the early 1970's. As older homesites matured this species has moved to more suitable areas outside the park.

White Throated Sparrow (*Zonotrichia albicollis*)-A common to abundant winter resident.

Fox Sparrow (*Passerella iliaca*)-A rare winter resident.

Swamp Sparrow (*Melospiza georgiana*)-A rare winter resident, found largely near marshy or wet fields near transmission line corridors.

Song Sparrow (*Melospiza melodia*)-A common winter resident.

Breeding Bird Species:

Since 1970, a total of 48 species, representing 5 orders and 16 families, have been recorded at MCNP during the breeding season (List 2). For this list, there are no permanent residents listed because they have already been included on the winter list. In Wilson's 1968 summary, he recognized 53 summer residents. In our data, we found that three breeding bird species had been extirpated. These species are

Warbling Vireo (*Vireo gilvus*)

Dickcissel (*Spiza americana*)

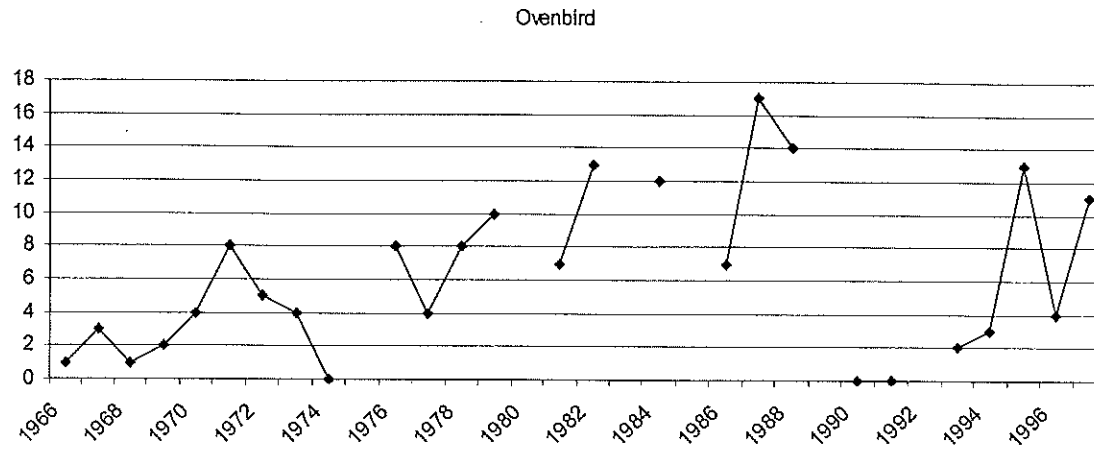
Bachman's Sparrow (*Aimophila aestivalis*)

For breeding birds, two species were increasing. These species are

Ovenbird (*Seiurus aurocapillus*)

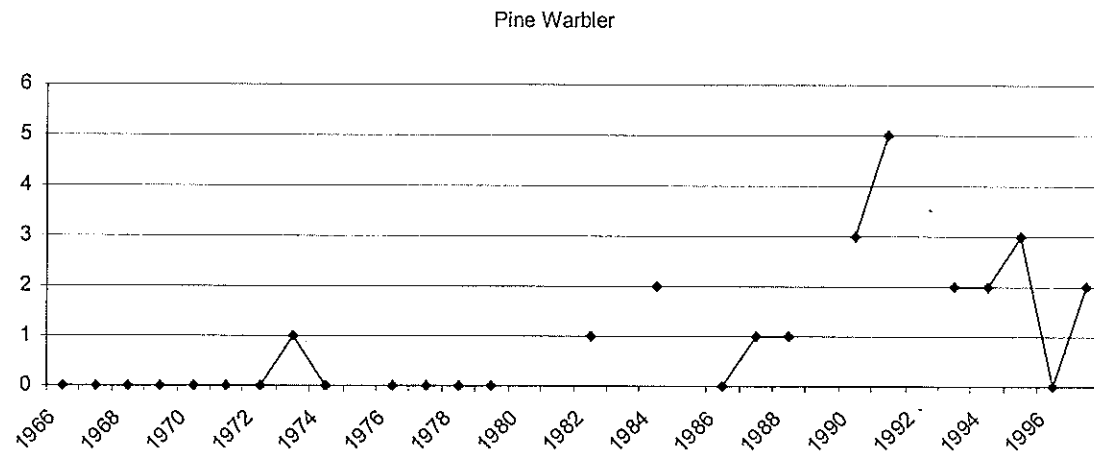
Pine Warbler

Figure 6



For the Ovenbird, the chart shows that the population is gradually increasing, probably due to management practices by MCNP.

Figure 7



For the Pine Warbler, the species is increasing during the breeding season only because the pine trees of the park have matured and provide a suitable habitat for this species.

For breeding birds, four species were decreasing. These species are

Wood Thrush (*Hylocichla mustelina*)

Kentucky Warbler (*Oporornis formosus*)

Yellow-billed Cuckoo (*Coccyzus americanus*)

Scarlet Tanager (*Piranga olivacea*)

Figure 8

Wood Thrush

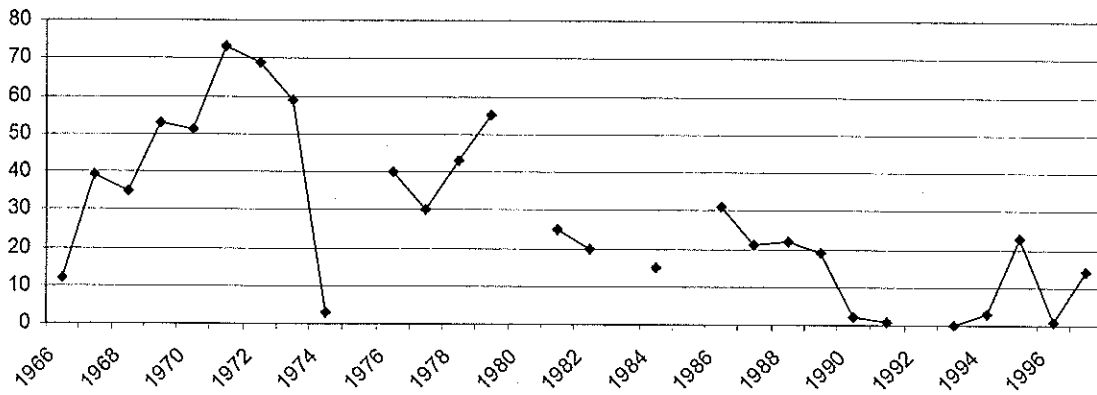


Figure 9

Ky Warbler

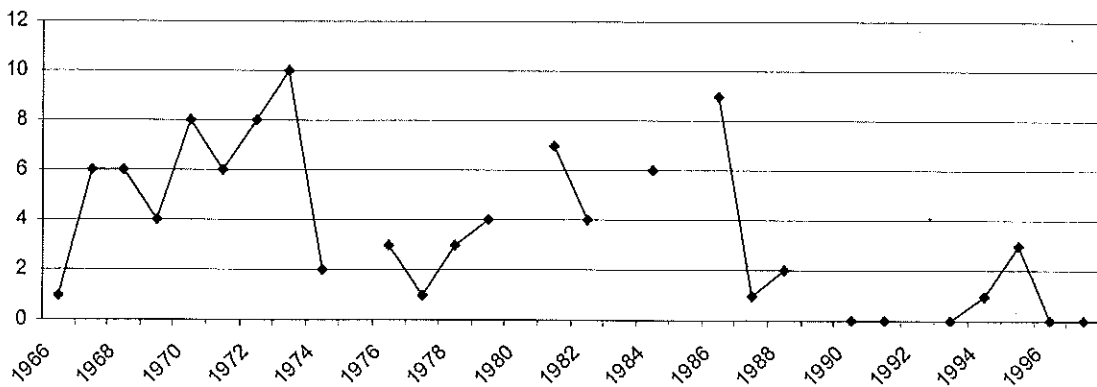


Figure 10

Yellow-Billed Cuckoo

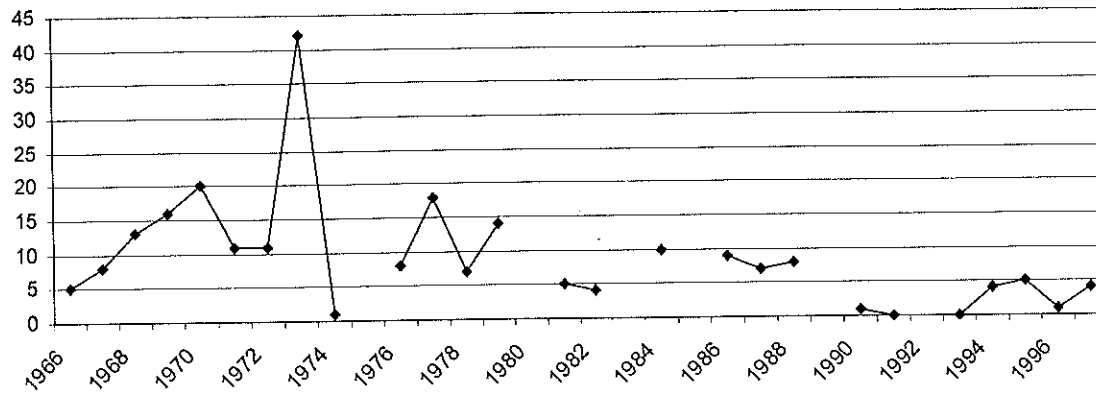
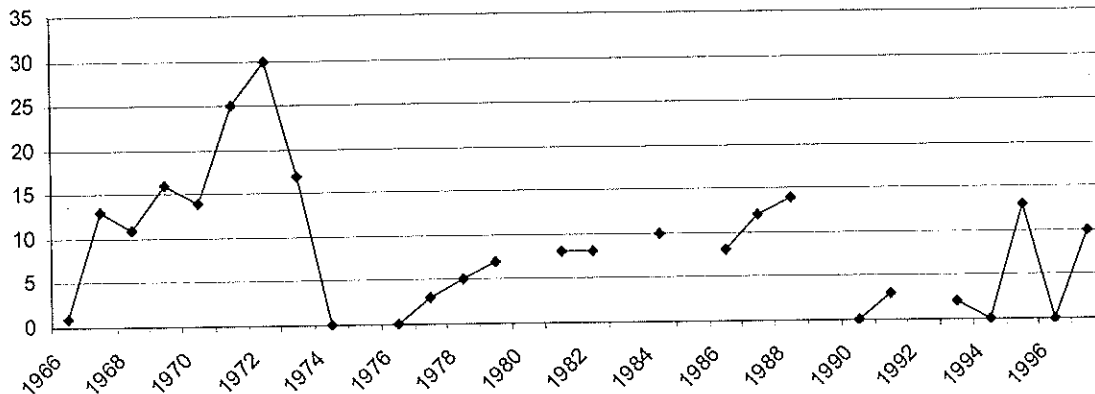


Figure 11

Scarlett Tanager



For the Woodthrush, Yellow-billed Cuckoo, Scarlet Tanager, and Kentucky Warbler, sharp declines have occurred, especially in the Woodthrush and the Yellow-billed Cuckoo. The decline in populations is probably due to the neo-tropical migrants' habitat being destroyed in the South American rainforest and at MCNP.

List 2. Breeding bird species at Mammoth Cave National Park

ORDER FALCONIFORMES

Family Accipitridae

Broad-Winged Hawk (*Buteo platypterus*)-Uncommon summer resident, but its relatively small size and secretive nature render it easily overlooked. Most often heard before seen; usually observed soaring over the river valleys, especially near the Mammoth Cave and Houchins ferries.

ORDER CUCULIFORMES

Family Cuculidae

Yellow-Billed Cuckoo (*Coccyzus americanus*)-Formerly a common summer resident, it is now uncommon and continuing to show significant declines in numbers.

ORDER CAPRIMULGIFORMES

Family Caprimulgidae

Chuck-Will's-Widow (*Caprimulgus carolinensis*)-An uncommon summer resident, more numerous near the park boundaries than in the wilder, deeper woodlands.

Whip-Poor-Will (*Caprimulgus vociferus*)-A common summer resident within MCNP, preferring more mature woodland on the north side of the park than the Chuck-Will's-Widow.

Common Nighthawk (*Chordeiles minor*)-Formerly a rare summer resident, this species is now rarely observed in the park except during fall migrations.

ORDER APODIFORMES

Family Apodidae

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Chimney Swift (*Chaetura pelagica*)-A rare to uncommon summer resident, most often seen near the visitor's center, or feeding over the Sloan's Crossing Pond, the Green River and Houchins ferries, or over First Creek Lake.

Family Trochilidae

Ruby-Throated Hummingbird (*Archilochus colubris*)-A common summer resident.

ORDER PASSERIFORMES

Family Tyrannidae

Eastern Kingbird (*Tyrannus tyrannus*)-An uncommon to rare summer resident, found in the few open fields or park-like areas within the park. Breeds each summer in the parking lot area near the Visitor's Center.

Great Crested Flycatcher (*Myiarchus crinitus*)-A common summer resident in most areas of the park.

Acadian Flycatcher (*Empidonax virescens*)-A common summer resident, particularly along heavily wooded, moist ravens.

Eastern Wood Pewee (*Contopus virens*)-A common summer resident.

Family Alaudidae

Horned Lark (*Eremophila alpestris*)-Wilson considered this species to be a rare resident, but it has not been observed on MCNP property since the mid-1960's.

Family Hirundinidae

Rough-Winged Swallow (*Stelgidopteryx ruficollis*)-A common summer resident, seen most often along the river drainages.

Barn Swallow (*Hirundo rustica*)-A rarely encountered summer resident, usually observed flying high overhead at the Visitor's Center or feeding at the Sloan's Crossing Pond. Abundant in farmland outside the park.

Purple Martin (*Progne subis*)-Formerly a rare summer resident, it is now seen regularly flying overhead at both ferries, the Visitor's Center, or the Sloan's Crossing Pond.

Family Troglodytidae

House Wren (*Troglodytes aedon*)-A rare summer resident, more common in suburban areas outside the park.

Family Mimidae

Catbird (*Dumetella carolinensis*)-An uncommon summer resident, preferring the edge habitats along roadsides and transmission-line cuts.

Family Turdidae

Wood Thrush (*Hylocichla mustelina*)-An uncommon summer resident, but its numbers are noticeably decreasing.

Family Sylviidae

Blue-Gray Gnatcatcher (*Polioptila caerulea*)-A common summer resident.

Family Vireonidae

White-eyed Vireo (*Vireo griseus*)-A rare summer resident, becoming less common as edge habitat continues to succeed to maturity.

Yellow-throated Vireo (*Vireo flavifrons*)-Common summer resident.

Red-eyed Vireo (*Vireo olivaceus*)-Common to abundant summer resident.

Warbling Vireo (*Vireo gilvus*)-Listed as a very rare summer resident by Wilson, this species is most likely extirpated from the park.

Family Parulidae

Black-and-White Warbler (*Mniotilta varia*)-Uncommon summer resident.

Prothonotary Warbler (*Protonotaria citrea*)-Common summer resident in suitable habitats (river bottoms at Sloan's Crossing Pond and First Creek Lake).

Worm-eating Warbler (*Helmitheros vermivorus*)-A common summer resident, especially along wooded, moist ravines.

Blue-winged Warbler (*Vermivora pinus*)-Uncommon summer resident in the few shrub-like areas remaining in the park.

Parula Warbler (*Parula americana*)-A common summer resident, especially in the older stands of bottomland forests.

Yellow Warbler (*Dendroica petechia*)-A rare summer resident, its numbers have sharply declined in recent years as the park has matured.

Cerulean Warbler (*Dendroica cerulea*)-An uncommon summer resident, particularly in the taller treetops along the river bottoms in MCNP.

Yellow-Throated Warbler (*Dendroica dominica*)-A common summer resident all along the Green and Nolin Rivers, especially among the larger sycamore trees.

Prairie Warbler (*Dendroica discolor*)-Formerly a common summer resident, now rarely encountered except in successional habitats along transmission-line clearings.

Ovenbird (*Seiurus aurocapillus*)-A common summer resident in the drier upland forest and showing evidence of increasing abundance.

Louisiana Waterthrush (*Seiurus motacilla*)-An uncommon summer resident. Formerly a very common resident along streams and springs, its numbers have declined in recent years.

Kentucky Warbler (*Oporornis formosus*)-This species was formerly a common summer resident, it is now uncommon and decreasing.

Common Yellowthroat (*Geothlypis trichas*)-Uncommon summer resident, restricted to edge habitats along roadsides, transmission-line corridors, and other open sites.

Yellow-Breasted Chat (*Icteria virens*)-Uncommon summer resident, preferring habitat similar to the Common Yellowthroat.

Hooded Warbler (*Wilsonia citrina*)-A common summer resident in the dense understory of moist woodland valleys.

American Redstart (*Setophaga ruticilla*)-A common summer resident, but is secretive nature and soft vocalizations make it easy to overlook. Frequents heavily wooded floodplain habitats, where it resides high in the treetops.

Family Icteridae

Orchard Oriole (*Icterus spurius*)-Rare summer resident.

Baltimore Oriole(*Icterus galbula*)-A very rare summer resident, but common during spring migration only to nest near the Visitors' Center.

Family:Thraupidae

Scarlet Tanager (*Piranga olivacea*)-A common summer resident, but its numbers have shown marked declines in recent years.

Summer Tanager (*Piranga rubra*)-A common summer resident.

Family Cardinalidae

Indigo Bunting (*Passerina cyanea*)-A common summer resident.

Dickcissel (*Spiza americana*)-Wilson described this species as a very rare summer resident within MCNP, but it has been most likely extirpated from the park, as suitable habitat does not exist.

Family Emberizidae

Grasshopper Sparrow (*Ammodramus savannarum*)-Once quite common within the park, this species is no longer found within the park. It is still common in suitable habitat just outside MCNP.

Bachman's Sparrow (*Aimophila aestivalis*)-This species has been extirpated from MCNP, as the severely eroded, low-grass fields have succeeded to woodland. None have been recorded since the late 1960's.

Chipping Sparrow (*Spizella passerina*)-A common summer resident in open areas of MCNP, especially near the Visitors' Center and the Job Corps site.

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